Simulations of Main Linac Quadrupole Jitter

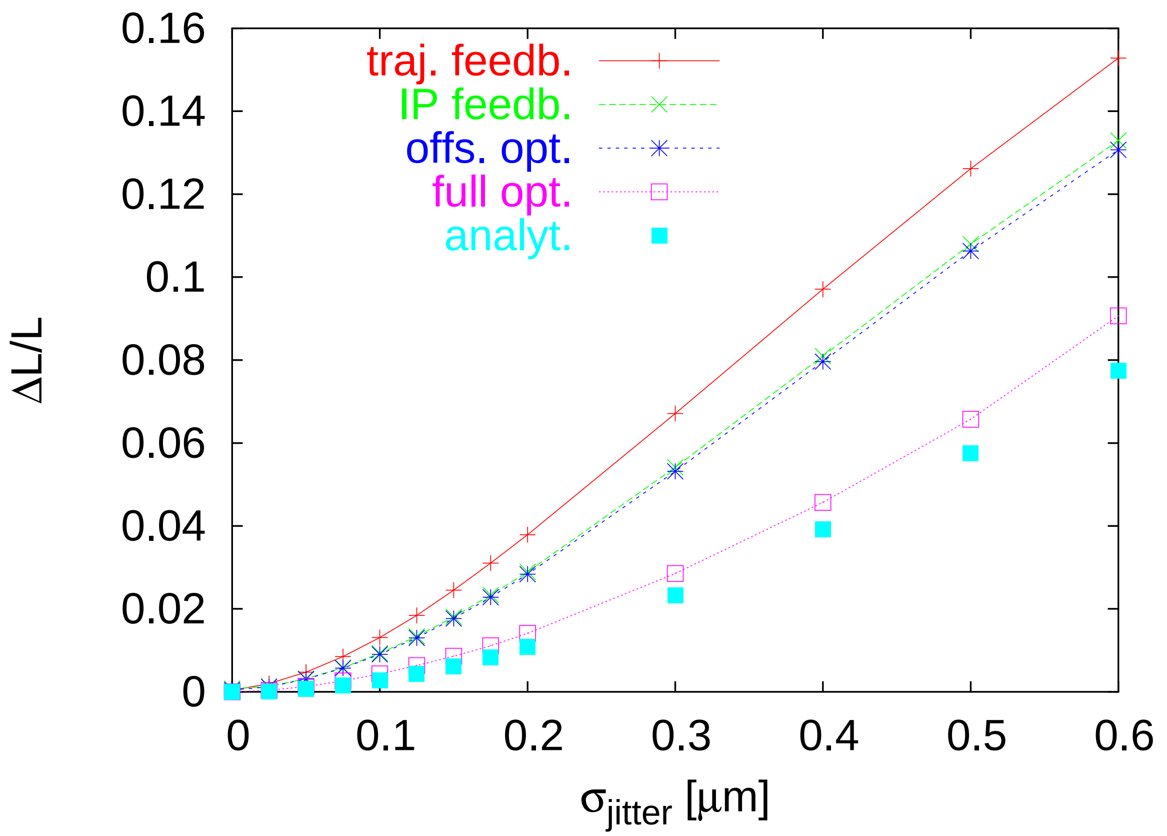
D. Schulte

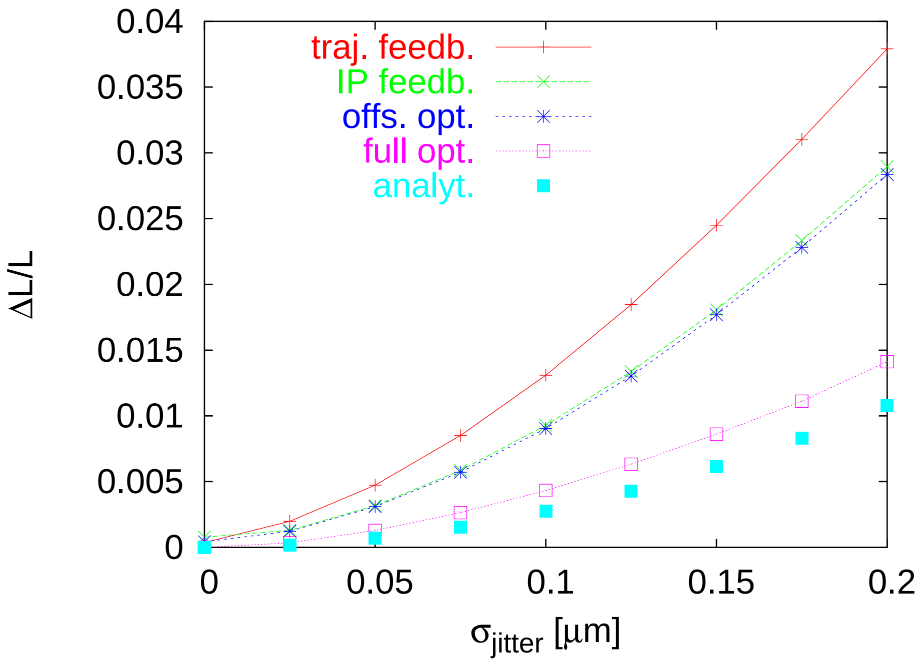
Simulation Procedure

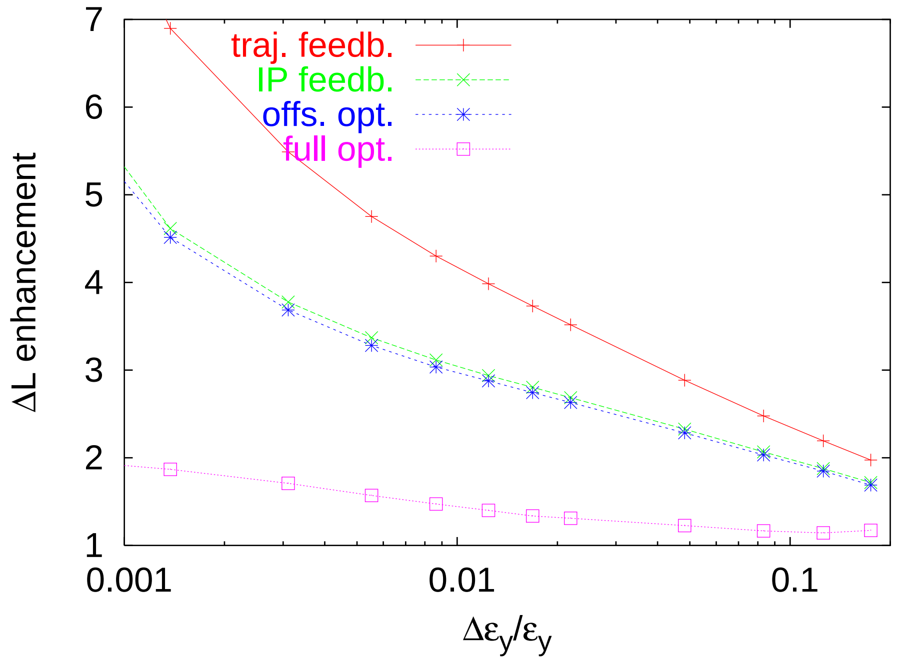
- Perfect inital machines assumed and jitter added
  - 32 cavity spacing...
- Different luminosities calculated
  - only intra-pulse trajectory feedback at the end of the linac
  - also intra-pulse beam-beam offset feedback
  - beam-beam offset optimisation at the IP
  - offset and angle optimisation at the IP
- Simulation done using
  - PLACET for main linac
  - matrix for BDS
  - GUINEA-PIG for beam-beam

Results for Quadrupole Jitter

- Vertical emittance=20nm







$\Rightarrow$ With no optimisation, a jitter of 100nm leads to 1% luminosity reduction

$\Rightarrow$ With optimisation, a jitter of 100nm leads to 0.5% luminosity reduction

$\Rightarrow$ The luminosity reduction with no optimisation is enhanced with respect to calculation using emittance growth